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FEASIBILITY OF STRESS-ONLY RUBIDIUM-82 PET MYOCARDIAL PERFUSION IMAGING TO REDUCE RADIATION EXPOSURE

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Background: Efforts to reduce radiation exposure in cardiac diagnostic imaging include a strategy of stress only SPECT myocardial perfusion imaging (MPI). The potential use of Rb82 PET/CT stress only MPI has not been investigated.

Methods: Two experienced independent blinded readers interpreted 100 Rb82 PET/CT and 100 Tc99m Sestamibi SPECT/AC MPI chosen at random from exams performed over 24 months. The interpreters viewed only stress images and categorized the results into normal, equivocal, or abnormal. Normal studies were those with no identifiable perfusion deficit and normal wall motion, LV cavity size and global function. Abnormal studies had an abnormality of perfusion or contraction. Equivocal studies could not be classified as clearly normal or abnormal without additional rest images. Patients with images interpreted as normal by both physicians would have qualified for a stress only protocol. Rb82 PET/CT radiation exposure was estimated based on published values. The average dose of Rb82 administered was 29 mCi each for rest and stress.

Results: Of 100 PET/CT studies, 44 (44%) would have qualified for stress only imaging (Reader A, 45%; reader B, 56%). Of 100 SPECT studies, 47 (47%) would qualify for stress only imaging (Reader A, 57%; reader B, 51%). All of the exams categorized as normal stress only images by the physician readers had previously been reported as normal rest and stress perfusion. Normal stress only PET/CT MPI were associated with a lower pre-test likelihood (43% vs 74%, p=0.0001) and lower age (59 yrs vs 68 yrs, p=0.002). Gender and body mass index (BMI) were not significant predictors (p=0.06, p=0.50). For SPECT MPI, only female sex was a significant predictor of a normal stress only MPI (66.3% female vs 29.8% male, p=0.001). BMI, age, and pre-test probability were not significant (p=0.79, p=0.46, p=0.28). PET/CT stress only imaging would have resulted in a mean reduction of radiation exposure of 8.9 mSV (Rb82 dose and CT).

Conclusion: Stress-only Rb82 PET/CT MPI is a promising strategy to reduce radiation exposure associated with MPI. Our data suggest that this strategy would be most applicable to patients with lower pretest likelihood, especially younger patients.